MAYOR & COUNCIL AGENDA COVER SHEET

MEETING DATE:

March 27, 2006

CALL TO PODIUM:

Erica Shingara
Environmental Services Director

RESPONSIBLE STAFF:

James Arnoult
Director of Department of Public Works, Parks Maintenance and Engineering

Erica Shingara
Environmental Services Director

AGENDA ITEM:
(please check one)

	Presentation
	Proclamation/Certificate
	Appointment
	Public Hearing
	Historic District
	Consent Item
	Ordinance
	Resolution
	Policy Discussion
X	Work Session Discussion Item
	Other:

PUBLIC HEARING HISTORY:

(Please complete this section if agenda item is a public hearing)

Introduced	
Advertised	
Hearing Date	
Record Held Open	
Policy Discussion	

TITLE:

Mosquito Control Program

SUPPORTING BACKGROUND:

In response to resident concerns over mosquitoes last year, the City consulted the Maryland Department of Agriculture's Mosquito Control Division (MDA) for an assessment of the situation and guidance on how to proceed. Jeannine Dorothy, MDA's Entomologist, conducted mosquito site inspections of lakes and properties in Kentlands on October 4, 2005. MDA noted that these inspection results would be indicative of conditions City-wide and therefore, this inspection was used as the basis for a City-wide action plan. Staff developed a mosquito inspection report and an action plan that was distributed to residents and the Mayor and Council in October of 2005.

Staff has recently updated the City-wide mosquito control action plan to reflect progress to date and will give a brief presentation.

In addition, during the course the site inspection, a number of residents expressed specific concerns about potential mosquito breeding in Lake Lynette as well aesthetic issues. Accordingly, the City authorized the engineering firm Charles P. Johnson and Associates (CPJ) to complete a more detailed analysis of Lake Lynette, an area receiving the most frequent mosquito complaints, to address issues related to vector control, habitat, water quality, and aesthetics. City Manager Humpton informed the Mayor and Council that upon the completion of this study he would schedule a work session on this issue. CPJ will present their analysis of Lake Lynette and management options.

Upon the completion of staff's presentation, residents will be given an opportunity to discuss their concerns and staff will seek guidance from the Mayor and City Council for implementation measures for the upcoming 2006 mosquito breeding season.

Attachments:
Attachment 1: Mosquito Inspection Report and Action Plan (updated March 22, 2006)
Attachment 2: Map of Mosquito Monitoring and Treatment Sites
Attachment 3: Lake Lynette Analysis and Options Summary Table (CPJ)
Attachment 4: Lake Lynette Site Plan (CPJ)

DESIRED OUTCOME:

Staff guidance on implementation measures.

MOSQUITO INSPECTION REPORT AND ACTION PLAN
MARCH 22, 2006

OVERVIEW

After receiving several complaints concerning mosquitoes in the Kentlands community, the City consulted the Maryland Department of Agriculture's Mosquito Control division (MDA) for an assessment and guidance. Jeannine Dorothy, an entomologist with MDA, offered to conduct a field consultation on Tuesday October 4, 2005 to inspect homes, yards, and the lakes and provide recommendations on how to reduce and eliminate mosquito breeding sites in the community. The City notified the KCA and various residents who had registered concerns about this meeting and a number of residents requested that their property be inspected.

The field consultation meeting was attended by seven residents and seven City staff members from the City Manager's Office (CMO), Department of Public Works, Parks Maintenance, and Engineering (DPWPME), and the Planning and Code Administration (PCA). MDA inspected Lake Nirvana, Lake Lynette and its three inlets, and approximately seven residential properties along Massbury Street, Firehouse Lane, and Lake Street.

MDA reported that the reason for the increase in mosquito complaints this year is because the Asian tiger mosquito (*Aedes albopictus*) has migrated to this area. The Asian tiger mosquito is an exotic species introduced to North America from Asia and has become a major pest throughout the entire Washington Metropolitan region. The tiger mosquito prefers older residential areas where shade and water-holding containers are common. The name "tiger mosquito" comes from its white and black color pattern—it has a white stripe running down the center of its head and back with white bands on the legs. These mosquitoes lay their eggs in water-filled natural and artificial containers such cavities in trees, bamboo, drainage pipes, and flower pots; they do not lay their eggs in ditches, marshes, or lakes. The Asian tiger mosquito usually does not fly far (100-300 yards) from its breeding site.

The Asian tiger mosquito has become a major pest in the Washington Metropolitan region. Unlike other species, it does not lay eggs in ditches or marshes, but primarily in natural and artificial containers, such cavities in trees, bamboo, drainage pipes, and flower pots. This species is also an aggressive day-biter.

Over the past three years the City has contracted with MDA to perform monthly monitoring and larvicide treatment of lakes and surrounding wet areas. This has been a relatively successful control strategy for other mosquito species; however, the Asian tiger species presents additional challenges by defying most mosquito stereotypes. This species will breed in anything that holds water, even the tiniest amounts, such as tree cavities, flowerpots, and clogged rain gutters. While most species feed at dawn and dusk and rest in the foliage during the day, the Asian tiger is an aggressive day-biter and will readily leave its shady resting area to feed, even in the direct sun.

INSPECTION RESULTS

During the course of the field inspection, the following locations were examined for mosquito breeding sites:

- Asian tiger and *Culex* larvae were breeding in containers. A holiday tree stand full of standing water was found on one residential property. MDA estimated that this one container could breed 500 to 600 mosquitoes a week. It is important for homeowners to inspect yards and to drain or flush containers twice a week.

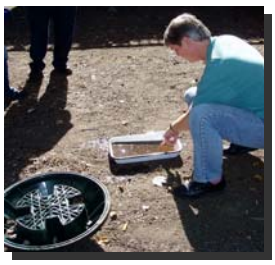
- Asian tiger and *Culex* larvae were breeding in cavities in trees in yards and the forest. These areas can be filled with sand to eliminate standing water.

- *Culex* and *Anopheles* larvae were found in puddles in ephemeral streams flowing into Lake Lynette. Given that these areas were treated with a granular larvicide within the last few weeks, MDA's entomologist was of the opinion that the larvae detected would not reach maturity.

- Although many residents expressed concern about potential breeding in the lakes, during the course of the inspections no larvae or evidence of mosquito breeding were found in Lake Lynette or Lake Nirvana. According to MDA, lakes and ponds are generally not good breeding sites because of changes in water elevation and flow, exposure to wind, and the presence of various natural predators, such as fish, birds, dragon flies, and beetles. However, all parties agreed that Lake Lynette needed aesthetic improvements, including debris removal.

- Although not found to be breeding during the current drought, MDA also stated that under wet weather conditions Tiger mosquitoes would likely breed in the plastic corrugated drainage pipes found along many homes throughout the community.

Mosquito Breeding Areas



Containers, such as this old holiday tree stand, can contain enough standing water to breed 500 to 600 mosquitoes per week.

Tree cavities are natural breeding sites. They hold dark water with a high organic content. These cavities can be filled with sand to eliminate standing water.

Plastic corrugated drainage pipes are common breeding sites. Cover the ends with cloth, such as pantyhose, to prevent mosquitoes from entering the pipe and laying eggs.

CITY-WIDE MOSQUITO CONTROL ACTION PLAN

MDA's entomologist noted that these results would be indicative of conditions City-wide and therefore this inspection was used as the basis for a City-wide action plan for addressing mosquito issues. The following summarizes the mosquito control action items and the City's progress to date (3/22/2006):

1. Public education and staff training: Since tiger mosquitoes are a primary concern, it is essential to promote homeowner education to prevent breeding sites. These breeding sites are the easiest to eliminate, provided there is the cooperation of the homeowner; without that involvement, it is an impossible task. Staff has collected materials to create a mosquito control education campaign, including an MDA program for cable TV, brochures, web information, and information for inclusion in HOA newsletters, etc.

In addition to public education, City staff will receive training to inspect and treat breeding sites. One staff member from DPWPME has already received inspection training and additional staff from DPWPME, Environmental Services, and Neighborhood Services will also be trained to inspect sites for breeding in the spring. MDA has offered to come to Gaithersburg in April or May (when larvae are present) to train additional City staff.

2. Mosquito monitoring and larvicide treatment program: The City will continue to contract MDA's mosquito monitoring and larvicide treatment services for City and homeowners association (HOA) properties. Monitoring and larvicide control is a preferable mosquito management option because it is more accurate, longer lasting, cost effective, and only affects mosquito larva (not other organisms). Monitoring of mosquito larva consists of walking the site to physically dip a cup of standing water to observe the developing larva. When an infested pool is identified a chemical is applied directly to the water that kills the mosquito larva before it reaches the next stage of development. A map depicting mosquito monitoring and treatment locations is included as Attachment 2.

In addition, since MDA starts their program in May and conducts monthly site visits, the City will supplement this program by sending trained staff to start the treatment program in April and conduct biweekly monitoring of the ephemeral streams throughout the season. MDA has provided the City with lists of insecticide vendors and certified contractors to help the City evaluate treatment options.

3. Research adult fogging option: MDA does not conduct adult spraying or "fogging" (space spraying from specially equipped trucks) in Montgomery County and since the Asian tiger mosquito is active during the day, this method is generally ineffective due to atmospheric conditions during daylight hours and the potential risk to human exposure. However, during the inspection, MDA's entomologist mentioned that there is a relatively new insecticide called lambda-cyhalothrin that can be sprayed with backpack equipment on private property and may effectively control tiger mosquitoes. Since it is a general insecticide that may kill other beneficial insects, the application requires a certified private contractor, public notification, and it is not part of MDA's standard treatment program. While staff does not recommend that the City implement a fogging program, we conducted preliminary research in the event that a homeowners association (HOA) or an individual property owner wanted to consider hiring a private contractor to perform this treatment.

Lambda-cyhalothrin is the active ingredient in a product sold as 'Demand CS'. It is a microencapsulated concentrate that can be mixed and applied for treating adult mosquitoes. While no pesticide is considered "safe", Demand CS is one product that has very low toxicity for humans and wildlife; however, it is highly toxic to fish/aquatic organisms and beneficial insects.

Adult fogging has an immediate effect while the control chemical is floating in the air but generally has no lasting effect as the chemical dissipates within minutes and leaves no residual control. Another type of adult treatment is applied to vegetation, called the barrier method, may have a longer residual effectiveness, depending on the weather. There are strict limitations regarding where the chemicals can be used, especially how close to standing water. This work is typically performed at dusk or dawn as this is when the required air conditions are acceptable to treat and many types of the adult mosquitoes are flying.

Pricing for treatments can range quite a bit depending on vegetation and size of property/properties. Contractors recommend a balance of surveillance, larvicide, and adult spraying as a last option and generally prefer to tailor their program and cost proposal to a specific site. For this reason, only very rough cost ranges could be estimated. Pricing for adult mosquito survey ranges from $25 to $50 a night, plus the cost of trap equipment ($125-$175). Pricing for adult treatment with lambda-cyhalothrin begins at $350 per treatment for approximately an acre.

LAKE LYNETTE ACTION PLAN

During the course the October 4, 2005 site inspection, a number of residents expressed specific concerns about potential mosquito breeding in Lake Lynette as well aesthetic issues. Accordingly, the City took the following actions to address these concerns:

1. Routine maintenance: DPWPME removed branches and debris in the upper section of Lake Lynette and will continue to monitor and remove debris (when feasible).

2. Adjust Lake Lynette's water elevation: In the spring, DPWPME will manually reduce the size of the low flow pipe to raise the water elevation approximately 2 to 4 inches. DPWPME will monitor the lake during rain events and adjust water levels to ensure safety. However, it should be noted that in periods of drought and high evapotranspiration rates, there is little the City can do to control water levels. As discussed in CPJ's analysis of Lake Lynette, raising the lake level any higher will require an engineering study and permitting, as it may be considered a high hazard dam in series (i.e., three dam structures are located immediately downstream).

3. Lake Lynette Bathymetric Study: The City authorized the engineering firm Charles P. Johnson and Associates (CPJ) to complete a bathymetric analysis of Lake Lynette, an area receiving the most frequent mosquito complaints, to address issues related to sedimentation. The bathymetric study determines the bottom elevations of the lake, compares them to original elevations, and calculates the change in storage capacity. This study is the first step in determining if dredging is required. The results of the bathymetric study are presented in a separate document.

4. Lake Lynette Assessment: The City authorized the engineering firm Charles P. Johnson & Associates, Incorporated (CPJ) to complete a more extensive analysis of Lake Lynette to address issues related to vector control, habitat, water quality, and aesthetics. This study evaluated options for mosquito control, water quality improvement, aeration options, habitat, and aesthetic improvements, and identified benefits, disadvantages, and costs. The results of this assessment are presented in a separate document.

Mosquito Monitoring and Treatment Sites

1 inch equals 3,264 feet
1,500750 Feet
500 250 Meters

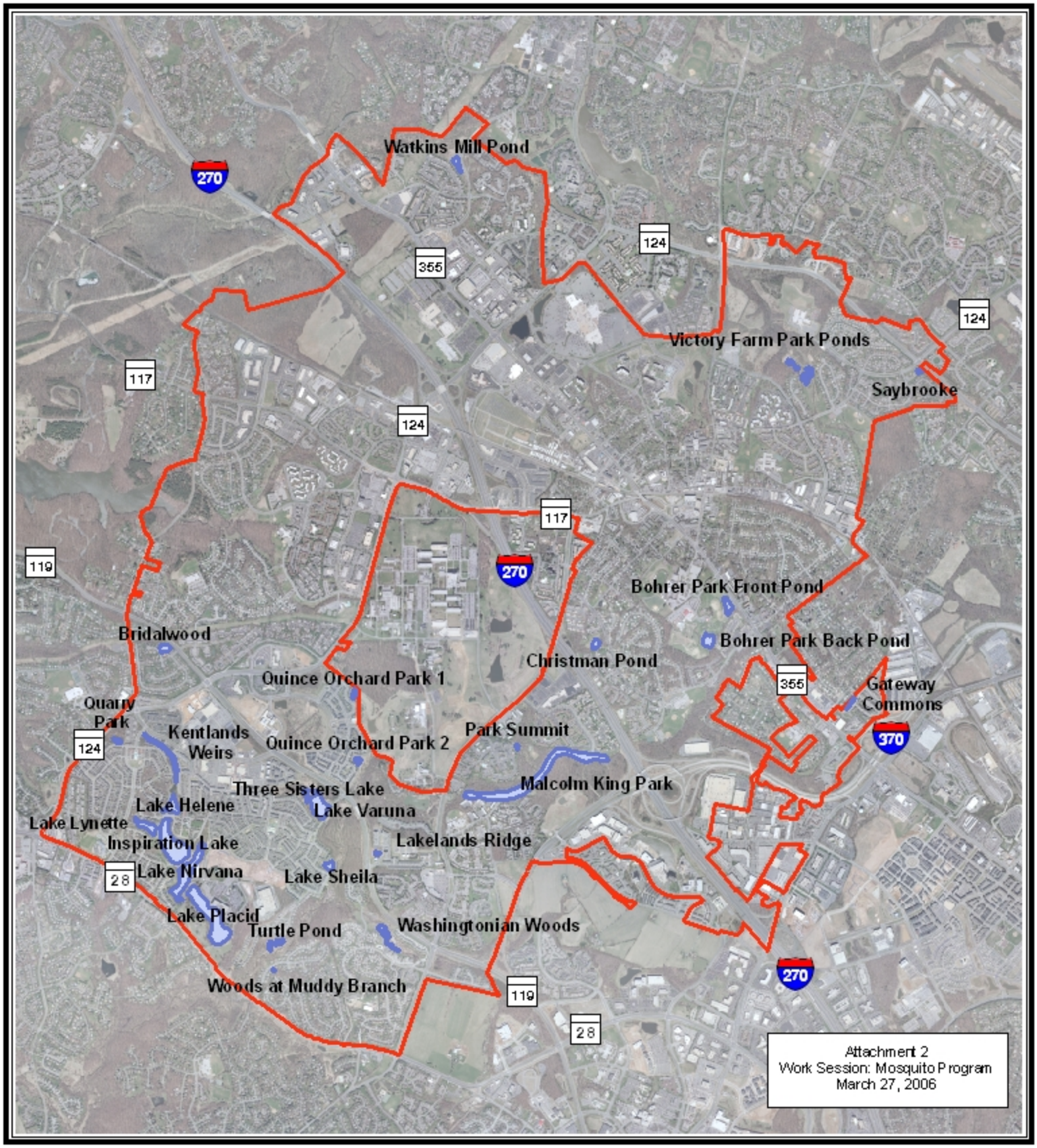
Mosquito 2006.mxd - 22-March-2006 - jkeleas

MD State Plane
HPGN NAD 83/91

Legend

- Mosquito Monitoring Locations
- City Boundary

City of Gaithersburg
Planning and Code
31 S Summit Ave
Gaithersburg, MD 20877
(301) 258-6330
www.ci.gaithersburg.md.us



Attachment 2
Work Session: Mosquito Program
March 27, 2006

Lake Lynette Options Summary

OVERVIEW

Charles P. Johnson & Associates, Incorporated (CPJ) was contracted by the City of Gaithersburg to conduct an analysis of Lake Lynette, a 2.1 acre lake located off Tschiffely Square Road in Gaithersburg, Maryland. As the first step in the process, CPJ conducted a bathymetric study which determines the bottom elevations of the lake, compares them to original elevations, and calculates the change in storage capacity. This study is the first step in determining if dredging is required. The second step of this study involved completing a pond assessment and alternatives analysis report to address vector control, habitat, water quality, and aesthetics in and around the lake, and evaluation of the three infall channels to the lake.

BATHYMETRIC STUDY

CPJ completed a bathymetric study of Lake Lynette in February 2006. CPJ verified the calculated amount of sediment on the lake floor by field testing sediment deposits at selected spots on February 2, 2006. At each spot a probe was used to determine the depth of sediment. Results showed that only 5% of sedimentation has occurred for the entire lake. From visual observation and probing, the sediment is mostly located in the upper third of the lake at the inflow points of the three streams that feed the lake.

For comparison, in developed areas of Maryland, the average deposition rate of sediment is somewhere between one-half and one-and-a-half inches per year. A rule of thumb for sediment estimation in lieu of actual bathymetric surveying would be to take the surface area of the lake times the number of years since the last dredge (or survey) and multiply by an average of three quarters of an inch of sediment a year. In the case of Lake Lynette, sixteen years (1990 to 2006) would generate approximately 3200 cubic yards of sediment. This conservative estimate of the bathymetric study results would then assume that 71% of the original permanent pool volume remains. (where 29% of storage has been used) CPJ recommends mandatory dredging when 50% of the lake volume is used up. Given the records available, our professional opinion is that the lake does not need to be dredged for water storage purposes at this time, although aesthetic dredging of the upper third of the lake might be pursued, if necessary. Assuming that between 5 to 29% of the permanent pool volume has been filled, the time remaining to reach 50% sediment accumulation is between eight and seventeen years, assuming three-quarters of an inch of annual sediment deposition.

MOSQUITO EVALUATION

In May of 2005, CPJ evaluated Lake Lynette to address concerns regarding mosquito breeding in pools in the inlets streams to Lake Lynette and the upper section of the lake. During a field visit, a handful of pools in the bedrock control areas of the infall channels contained a small amount of continual base flow. Mosquitoes on average need non-flowing, stagnant, predator free water for about 72 hours to breed successfully. Streams and lakes generally do not provide the best breeding habitat due to flowing water and the presence of amphibian and avian predators. However, they can breed in stagnant pools with poor or absent aquatic habitat. The only other way to reduce possible breeding habitat is to pipe the stream or its aquatic habitat should be improved. The chances of regulatory approval for pipe extension are virtually nil. Therefore, the best plan for long-term mosquito control is to (1) continue to monitor the stream for unnatural (manmade) debris and have it removed promptly; (2) provide monitoring for future stream stabilization work and lastly; (3) provide mosquito vector control through a legal, environmentally sensitive insecticide application. In addition, the passive support of mosquito control from natural predators could be enhanced with the planting of diverse natural vegetation. Accordingly, the City of Gaithersburg is currently implementing option 1 and 3, by routinely removing debris and contracting with the Maryland Department of Agriculture (MDA) to monitor and treat this area with a larvicide.

MANAGEMENT OPTIONS

When considering the appropriate course of action for possible approaches to Lake Lynette, the end goals must be considered. In this case, there are four main goals: nuisance vector control (mosquitoes), water clarity (turbidity/suspended sediment control), algae control, and improved aesthetics. It should be noted that no single approach will solve all of these goals, where each has a situation, time, and/or place for their most effective use. It is also important to note that the best decision cannot be made without some amount of water testing. At minimum, water testing through the summer will provide some measure of the basic physical, chemical, and biological condition

of the lake, which will then provide the basis for selecting the most appropriate water treatment strategy. The attached table provides of summary of each of the following options and outlines their benefits, disadvantages, and potential costs.

Option 1: **Mosquito Larva Monitoring and Control** [Vector Control]: The City currently contracts with the Maryland Department of Agriculture (MDA) for monitoring and larvicide mosquito control services. The main advantages are a reduced mosquito population, and that this is an already ongoing, relatively inexpensive option and targeted only to mosquito larva (not other organisms). The main disadvantage is that this option does not address container breeding Tiger mosquitoes on private property. This option also does not address sediment in the bottom of the lake.

Option 2: **Raising Lake Level** [Water Clarity] [Improved Aesthetics] Raising the lake level six inches to a foot to increase water depth and aesthetics. The cost would be approximately $100,000 if the riser is replaced and fill added to dam. This option is most likely not likely to receive permits without retrofitting the riser and adding fill to the dam. Even then, permits may still not be granted due to safety concerns related to lake storage capacity during large rainfall events and the presence of three high hazard dams in series immediately downstream of the lake.

Option 3: **Dredging** [Water Clarity] [Improved Aesthetics] Dredging is expensive; a complete lake dredge could cost up to $100,000. Dredging is also an unsightly process, during which time the dewatered lake will remain a malodorous, muddy mess for several weeks or more during the process, and the frequent stream of machinery and tandem trucks hauling sediment are disruptive. More importantly, the results of bathymetric survey show no need for dredging at this time. The likely time frame for Lake Lynette is approximately 8 to 17 years. Given the large costs and disruptive process, it is better done all at once for the whole lake, as opposed to a small portion of the lake.

Option 4: **Forebay Installation** [Water Clarity] [Improved Aesthetics] The cost of a forebay to address sedimentation in the upper portion of the lake would be approximately $70,000, including a partial dredge that may be required to get to firm surface. The forebay should not be done solo since the lake will need to be drained regardless, whether just forebay is dredged or whole lake is dredged. Placement of a forebay stone/earth berm will require some minor dredging.

Option 5: Plantings [Vector Control] [Improved Aesthetics] [Algae Control] Actual vector control and algae control is minimal, although aesthetics can be improved. This option is not strongly recommended unless a robust planting plan (with corresponding expense) is utilized with aggressive anti-goose measures for the first couple of years until plants are established.

Option 6: Diffuser Aeration [Algae Control] [Water Clarity] [Vector Control] This is likely the best option for Lake Lynette at this time. The main advantages are that this is a more economical approach that will likely address several of the concerns. The cost is moderate compared to other options, and it provides improved circulation of oxygen in the lake, which should reduce algae, improve plant and predator life, which in turn improves habitat of mosquito predators. Running electricity to the lake will be an added expense. *Water quality testing should be performed prior to installation to insure that this method will address the water quality concerns.*

Option 7: Surface Aeration [Algae Control] [Water Clarity] [Vector Control] This option is more expensive than diffuse aerators, and is more prone to mechanical problems due to moving parts. Wave action from increased water movement could cause bank erosion, in turn increasing sediment to the lake. Underwater piping is expensive, and clean water is required for optimal operation. Running electricity to the lake will be an added expense. This may not the best option for Lake Lynette at this time.

RECOMMENDATIONS

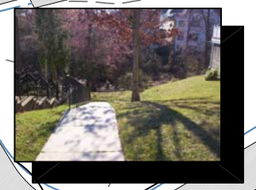
As previously noted, no single option covers all four goals. The following recommendations were selected based on the potential to achieve the four main goals and the cost effectiveness of the option. Based on available information and a preliminary investigation of the lake, continuing with larvicide (Option 1) is a good option for controlling mosquito populations. In addition, adding a set of diffuse aerators (Option 6) to the lake may provide “the best bang for the buck” in terms of algae control, water clarity, and a more hospitable lake environmental for mosquito predators. Aesthetics could be improved through plantings (Option 5), although this is not warranted, since the main concern regarding aesthetics relates to the lake bottom sediment. Aesthetic improvement may be achieved through the improved circulation of oxygen through the water. Dredging and forebay installation (Options 3 and 4) are options that should be considered in the future, when the lake actually requires dredging (8 to 17 years). It is highly recommended that water quality testing be performed to provide the most accurate description of the existing pond conditions.

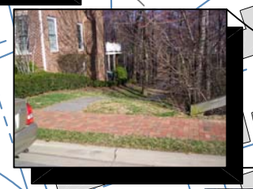
Options for Lake Lynette

No.	Option	Description	Pros	Cons	Costs
1*	**Mosquito Larva Monitoring and Control*** *Goal: Vector Control*	Monitoring and larvicide control of mosquito larvae populations	• A targeted, more accurate approach that reduces local populations of mosquito larvae and does not affect other organisms. • Already being done by Gaithersburg	• Needs to be done on a monthly basis throughout the breeding season. • Does not address container breeding Tiger mosquitoes on private property and therefore will not eliminate the problem 100%	Under large contract costs are relatively minimal; approx. $3800 per year for the entire City
2	**Raising Lake Level** *Goals: Water Clarity, Improved Aesthetics*	Raising lake level six inches to a foot to increase water depth for better clarity	• Increases lake depth, delaying need for dredging and improving aesthetics	• May not serve stormwater management control • Requires design and permitting and unknown construction.	Permitting approx. $30,000 plus unknown construction costs
3	**Dredging** *Goals: Water Clarity, Improved Aesthetics*	Mechanical removal of pond sediment from the entire lake (it is not cost effective to permit and dredge upper portion only)	• Removes bottom sediment, resulting in aesthetic improvements, increased storage • Nutrient-rich muck removed, increases photosynthesis (oxygen production)	• Lake draining, noise, odor, machinery are unpleasant • Dredging operation will last several weeks • Expensive, requires lake access, design, likely tree losses • Permitting may take one year or more • Bathymetric shows no need for 8-17 yrs (but will eventually be necessary)	• Mechanical dredging approx. $50-70 per cubic yard (off-site disposal) • Permitting additional, approx. $20,000 • Approx. $80-$100,000 total

No.	Option	Description	Pros	Cons	Costs
4	**Forebay Installation** *Goals: Water Clarity, Improved Aesthetics*	Installing a berm in the bottom of the lake to trap sediments for easier dredging	• Localizes sediment in one area, allowing only part of the lake to require dredging. • Can be easily done with lake dredging, but would take more time if done alone	• Requires more frequent dredging of that portion of the lake • Should be installed after dredging, while lake is dewatered • Requires access, tree loss, permitting	• May require dredging, three days of labor, setup, and material cost, approx. $30,000 • Permitting, approx $25 – $40,000 • Total cost approx $55-$70,000
5	**Plantings** *Goals: Vector Control, Improved Aesthetics, Algae Control*	Emergent plantings around pond perimeter	• Helps reduce pond algae • Increases habitat for pond life, mosquito predators. • Adds oxygen	• Favored by waterfowl • May reduce permanent pool • If sediment is too "fluffy" plants may need to be stapled to secure them	Varies by plants selected, and planting area. Approx. $8,000 for plants, plus labor. Goose fencing is critical, and adds extra expense
6*	**Diffuser Aerators*** *Goals: Vector Control, Algae Control, Water Clarity*	Air compressor system mixes water in the pond. Only circulates oxygen, does not add it	• Helps promote aerobic biological activity by recirculating oxygen and water movement • Less prone to mechanical problems than surface aerators • Circulates water but not so much that bank erosion is a problem	• Most efficient in deeper ponds (greater than six feet deep), but effective in shallow ponds as well • Requires electricity to be installed to the lake	• One compressor with six heads, approx. $6,000 • Annual maintenance approx. $1,000 to replace filters, carbon vanes • Cost to extend power to lake is extra
7	**Surface Aerators** *Goals: Vector Control, Algae Control, Water Clarity*	Resemble fountains. Motor mounted to an impeller (agitator) to "splash" water. Should be removed in fall and reinstalled in spring to prevent damage from freezing	• Adds oxygen to water • Can be used in water as shallow as 36 inches. Smaller units can be put in shallower water but would be of minimal use in a larger pond like Lake Lynette	• Require clean, debris-free water • Requires electricity to be installed to the lake, and greater lengths of submersible power lines in the lake • Prone to mechanical problems • Excessive wave action may erode lake edges	• One hp motor plus three units approx. $22,500 • Seasonal removal/ reinstallation approx. $1500 per year • Cost to extend power to lake is extra

* Recommended options for near-term management of Lake Lynette (rows highlighted)





Leekes Lot Way

Firehouse Lane

Tschiffely Square Road

Inspiration Lane

Inspiration Lake

Access #1 (225 ft.) - All Options

Access #1 Extension (Options 3 and 4)

Access #4 (155 ft.) Option 3 and 5

Existing Concrete SWM Riser

Asphalt Pathway

Possible diffuse aerator head locations (Subject to adjustment per installer requirements)

Access #2 Extension (Options 3 and 4)

Survey Boundary

Area of Concern

Area of Concern

Island

Outfall #5

Outfall #4

Outfall #2

Outfall #1

Outfall #6

Outfall #7

Access #3 (255 ft.) Option 3 and 5

Access #2B (615 ft.) All Options

Access #2A (560 ft.) All Options

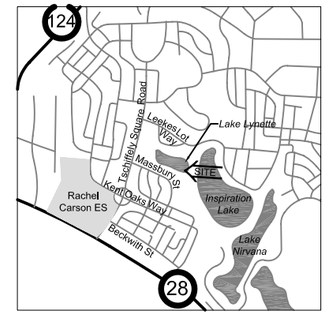
Massbury Street

Holmard Street

Massbury Mews

Kent Oaks Mews

Kent Oaks Way



Vicinity Map

Source: ADC Montgomery County Map 18, Grid J-13

LEGEND

- Forest
- Potential Access Route (Options 3 and 4)
- Potential Access Route Extension (Options 3 and 4)
- Stream
- Existing Contour
- Possible Planting Area (Option 5)
- Outfall
- Direction of Water Flow
- Possible Diffuse Aerator Head (Option 6)

ACCESS AREAS

RANK	ACCESS #	STREET	NOTES	SLOPE	LENGTH (FT)
1	1	Firehouse Lane	Established, paved vehicle access	5.8%	225
2	2A/2B	Kent Oaks Mews	Variable slopes, long	Varies: 6.1 - 10.8%	560/615
3	3	Tschiffely Sq.	Access along driveway of landowner	8.6%	255
4	4	Firehouse Lane	Steep access to upper portion of lake, through easement	17.4%	155

General Notes:

1. The bathymetric survey was completed by CPJ on 2/3/06.
2. Tree locations (canopy) cover was estimated using aerial survey.

Attachment 4
Work Session: Mosquito Program
March 27, 2006

0 25 50 100 200

Owner:
City of Gaithersburg
31 South Summit Avenue
Gaithersburg, MD 20877-2098
Attn: Ms. Erica Shingara
(301) 258-6310 x 171

Gaithersburg
Election District 9
Montgomery County, Maryland

Lake Lynette Dredging Feasibility, Pond Maintenance, and Aesthetics Study

Lake Lynette
Gaithersburg, MD

DATE: 3/06
DESIGNED: OWN
DRAFTED: OWN
CHECKED: TCS
BASE DATA: Gaithersburg GIS

NO.	REVISIONS	BY	DATE

CPJ Associates
CPJ Environmental Services Division
STREAM RESTORATION • STORMWATER MANAGEMENT • INSPECTION
910 CLOPPER ROAD SUITE 215N GAITHERSBURG MARYLAND 20878
Phone:(301)208-9575 E-mail:env●cpja.com Fax:(301) 926-4551
SILVER SPRING, MD FREDERICK, MD FAIRFAX, VA GAITHERSBURG, MD

SCALE AS SHOWN

SHEET 1 OF 1 SHEETS

JOB NO. 36-503